14:International Bank S-5 (1954) 1955 I.ID1 Syria MD1

1960, or an annual average of around £S 14.3 million over the period 1955-60.

The principal task of the central government in this field will be to assist towns and villages in obtaining adequate supplies of pure drinking water. Now that the expensive new system for Aleppo is virtually complete, it should be possible to devote more resources to the smaller cities and villages. Some £S 5 million will still need to be spent on expansion and improvement of the distribution network in Aleppo. Aside from this amount, we recommend that the government allocate about £S 8 million over the period 1955-60 for water supplies in towns and villages. The government has recognized that the problem is most acute in the Hauran and the Djebel Druze. Much of the population in these provinces is dependent on rain catchment for its water supply, and supplies in catchment basins quickly become polluted and occasionally dry up. The problem in these regions is complicated by the dearth of underground water, which necessitates expensive geophysical surveys. Elsewhere in the country there are still many villages and towns which urgently require pure water. For example, Hassetche, although the capital of Jezireh, is dependent on water drawn directly from the Khabour river and peddled from carts in the city streets. Because the need is so great, funds for water supply will have to be used with great economy. Extensive distribution systems which are expensive to install and maintain must be avoided. In the smaller villages a centrally located well will generally suffice. For the larger villages and towns the water should be piped to a limited number of public fountains where inhabitants can draw it for their domestic needs.

Waste disposal is also an important problem, especially from the standpoint of public health. Even the larger cities have not fully solved this problem. In Damascus, for instance, the sewers empty into the Barada river, whose water is used farther downstream not only for irrigation but also for drinking. The most immediate need, however, is for proper waste disposal in the villages. The construction of latrines and cesspools appears to be the only feasible solution there, and the community self-improvement program which, in accordance with our earlier proposals, would be initiated by community workers, should focus at least in part on the improvement of village sanitation by this means. To overcome any public inertia, the government might find it advisable to give squatting slabs or some comparable assistance to householders as an incentive to construct and use latrines.

variation exists between the living conditions of the more prosperous farmers and of the peasants, many of the latter possessing little beyond the barest necessities.

The larger cities, as Damascus and Aleppo, have been important junctions on trade routes from India to the Mediterranean for centuries, and reflect the influence of both Eastern and Western civilizations. They are a combination of the old Arab-type city and the modern, with most of the amenities of urban life. The older sections are usually made up of several quarters, dominated by different racial or religious groups. The houses are constructed of stone, brick or reinforced concrete and stucco, with flat or tiled roofs. In Damascus, about one third of the inhabitants live within the limits of the ancient city and a third in the modern residential developments.

The Bedouin follow essentially the same pattern of life in Syria as in other countries of the Near and Middle East. The nomadic tribes dwell in tents made of goats' hair, usually in close association with their livestock. Their standards of living are primitive, both in the tent encampments and the semipastoral settlements.

ENVIRONMENT AND SANITATION

Water Supplies

Water supplies are deficient in many sections of the country, and acute shortages may be experienced during the dry season. In the rural areas, domestic supplies are obtained from deep or shallow wells, springs or rivers, and sometimes from rain-water cisterns. *Korazes*, or wells connected by underground conduits which often extend for several miles, and waterholes, dug in the plains or near watercourses, are used in some districts. The village supplies are frequently polluted and responsible for the spread of intestinal infections.

The water supply of Damascus is taken from an underground reservoir at 'Ain el Fije, which is fed by springs in the Anti-

312 Lebanon mountains. It flows by gravity through tunnels to the waterworks in the city, from which it is distributed to the individual houses or, in the more congested districts, to public fountains. The overflow 312 is discharged into the Barada River. The 314 supply is not treated, but its purity is checked daily at 'Ain el Fije, and samples are submitted twice a week to the government laboratories for bacteriologic and chemical examination. The water of the Barada River is no longer used for domestic purposes, being reserved for other municipal requirements.

Untreated water from a spring-fed reservoir supplies the city of Aleppo. The present supply is inadequate, and plans have been projected to conduct water from the Euphrates River to a plant near Aleppo, where it will be treated by sedimentation and 312 chlorination before distribution. Hama obtains most of its supply from wells linked by tunnels, but part of the town depends upon an ancient system in which the water 312 is lifted from the Orontes River by means 406 of huge water wheels and distributed in open overhead aqueducts. These wheels, or *na'ouras*, are operated by the force of the current and collect the water in buckets attached at intervals around their circumference. They are often utilized in small irrigation works, where the river is situated below the level of the surrounding plain.

312 Simple methods of irrigation are practiced in many districts bordering the larger rivers. The Al Ghouta, or oasis of Damascus, has been irrigated by the Barada River and its tributaries for centuries: some of the canals have undoubtedly existed since 312 Roman times. Pumps are sometimes em- 406 ployed in the Al Jazira region, while *na'ouras* are common in certain sections along the banks of the Orontes, the Eu- 312 phrates and the Khabour rivers. Several large irrigation projects have recently been undertaken under the supervision of the Ministry of Agriculture. These include the irrigation of over 35,000 acres in the Homs-Hama region and the drainage of portions

of the Muzeirib swamp lands along the headwaters of the Yarmuk River. The resettlement program in the Euphrates and the Khabour river basins, which is controlled by a separate governmental organization, calls for the irrigation of extensive areas. Between 20,000 and 30,000 acres had been opened up through irrigation in 1951. Work on the drainage and the irrigation of the Ghab marshes, covering about 100,000 acres in the Orontes river valley northwest of Hama, was started in 1952.

Waste Disposal

Sewerage systems are available in all the larger cities. The sewage is not treated, however, and the effluent is usually discharged into adjacent watercourses or upon the land for irrigation purposes. In unsewered sections, cesspools are employed in connection with the houses. The methods of sewage disposal are universally primitive in the rural districts. In villages near the larger cities, pit or shallow latrines are frequently found in the individual compounds or provided on a community basis. In the more remote areas and in the poorer villages, pollution of the soil is the general practice. The use of night soil for fertilizer is common in the agricultural communities.

Fauna and Flora

Arthropods. Mosquitoes. Nine species of anopheline mosquitoes have been reported from Syria, three of which—*Anopheles superpictus*, *A. sacharovi* (— *A. elutus*) and *A. claviger* (— *A. bifurcatus*)—are of major importance in the transmission of malaria. *A. pulcherrimus*, *A. hyrcanus*, *A. algeriensis* and *A. sergenti* are of minor and local significance, while *A. marteri* and *A. multicolor* are rare.

A. superpictus is widely distributed: It is a prominent vector of malaria in the coastal plains, in the northwestern highland districts and in the river valleys, but is of secondary interest in the Damascus region. It breeds along the margins of the larger rivers and on the edges of mountain streams

844 parts of the country. The graduate pharmacists totaled 214.

DISEASES

659 Widespread discrepancies in reporting de-
165 tract from the validity of the morbidity and the mortality statistics. Among the two thirds or more of the population living in the rural villages, not only is the reporting of cases of illness and death poor, but the accuracy of diagnosis is often questionable. In a total of 15,457 deaths officially recorded in 1949, almost 35 per cent were listed as due to "ill-defined, unknown or unspecified" causes. Facilities for laboratory confirmation are lacking outside the larger population centers, and confusion is frequently evident in the differentiation of related infections. Reporting is negligible in the more remote areas, and particularly
659 among the Bedouin tribes. Except in the
165 course of special surveys, or when abnor-
758 mal epidemic conditions necessitate the enforcement of preventive measures, medical treatment is seldom accessible to the in-
659 habitants of such regions. Even in cities,
165 where the degree of reporting is considerably higher than in the rural areas, the morbidity statistics reflect a general tendency to evade the reporting of certain infectious diseases for fear of isolation. The records of cases treated in the government hospitals, which cannot be regarded as representative, and the reports of particular investigations or surveys provide the most reliable data for the evaluation of the prevalence and the distribution of specific diseases.

Diseases Spread or Contracted Chiefly Through Intestinal or Urinary Tract

164 **Typhoid and Paratyphoid Fevers.** Enteric fevers are endemic, and, in the opinion of the local authorities, a high degree of immunity resulting from repeated exposure to infection exists among the inhabitants.
164 Cases of typhoid fever occur throughout the
364 year, with the peak of incidence usually between June and December, when the con-

sumption of fly-contaminated foods and of raw vegetables grown in polluted soils provides an important means of transmission. Water-borne outbreaks are frequent in the rural villages, but they have decreased within recent years with the improvement of the drinking water supplies in the larger cities. Reports for 1949 show that 495 cases of typhoid fever were treated in government hospitals throughout the country, 295 cases in institutions in Damascus *muhafazat*. Similarly, 671 cases were recorded in 1950.

The relative prevalence of the different paratyphoid infections is uncertain. Paratyphoid A fever predominates among the cases in which the differential diagnosis has been established, although paratyphoid B infections are undoubtedly more numerous. Paratyphoid C fever has been diagnosed in Lebanon, but its presence in Syria has not been determined.

Immunization with typhoid-paratyphoid A and B vaccine is carried on by the health authorities among the contacts of known cases. Immunization is also widely practiced in the urban areas.

Dysenteries. Dysentery is prominent among the causes of illness. The available data give little indication of the proportionate prevalence of amebic and bacillary infections. Amebiasis is widespread, and associated with a high percentage of chronic carriers. Contaminated foods constitute the chief sources of infection, and the maximum incidence is noted in spring and summer, when lettuce and other green, leafy vegetables are consumed in abundance.

Recognized *Shigella dysenteriae* infections are rare, but occasional bacteriologically confirmed cases are recorded. Strains of the Flexner group are probably responsible for the majority of cases of bacillary dysentery. The differentiation of types is made only in Damascus, and, since few cases are hospitalized, the existing records have little significance.

Diarrhea and enteritis are prevalent, especially in infancy and early childhood. Local authorities state that fully 85 per cent

cept in the vicinity of the principal rivers. 312
Domestic supplies are derived from wells, springs or rivers, and sometimes from water holes or rain-water cisterns. Untreated 312
piped water supplies serve all or parts of 364
the larger towns. The municipal supplies of Damascus and Aleppo are controlled for purity, but contamination is frequent in the smaller communities. Sewerage systems are available in the chief cities, but the methods of sewage disposal are generally primitive in towns and villages. The standards of nu- 146
trition vary, depending upon the economic and the social conditions in different regions. Undernutrition and subclinical avitaminosis are widespread, but serious deficiency diseases are encountered only among limited population groups.

The most prominent disease problems are 164
malaria, trachoma and dysentery, both amebic and bacillary. Enteric fevers, tuberculosis, helminthiasis and skin infections are prevalent. Venereal diseases are widely distributed, while bejel is endemic among the nomadic and the seminomadic peoples of the northeastern provinces. Hookworm infection, schistosomiasis, caused by *Schistosoma haematobium*, and leprosy exist in scattered foci. Localized outbreaks of cholera were reported in 1947-48, the first in 20 years. Vaccination against smallpox is com- 951
pulsory, but sporadic cases and occasional epidemics are recorded. Outbreaks of louse- 164
borne typhus are recurrent, while sporadic cases are reported almost annually. Small outbreaks of louse-borne relapsing fever have coincided with regional epidemics. Measles and the common respiratory infections are endemic, and frequently epidemic. Cutaneous leishmaniasis, brucellosis, rabies, tetanus, anthrax, dengue fever and sandfly fever are endemic. Meningococcus meningitis, diphtheria, plague, tick-borne relapsing fever and murine typhus are sporadic. Recognized cases of scarlet fever and poliomyelitis are apparently rare. Doubtful cases of tick-borne typhus and kala-azar have been described.